California Energy Commission
Public Interest Energy Research (PIER) Program
Environmental Area Research

Strategies for Converting Bioresources to Power for Californians

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Fact Sheet

The Issue

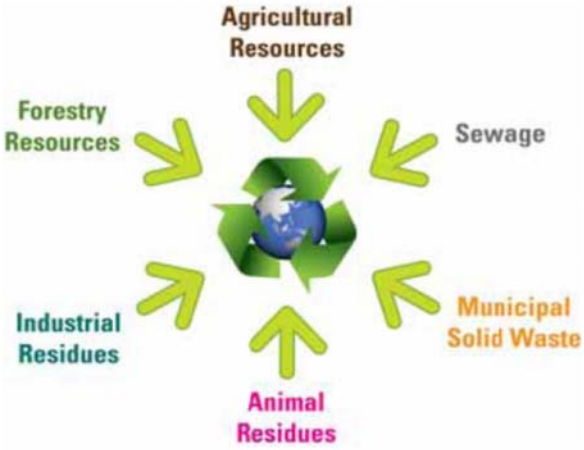
Among the principal barriers and knowledge gaps for increasing biopower generation in California are the uncertain costs and emission factors for new bioenergy technologies. Due to the variety of bioenergy technologies and feedstock variability, emission factors for certain technologies are incomplete. Updated emissions inventories and knowledge of the spatial distribution of emissions from biopower are needed to assess potential air quality benefits and impacts of increasing biopower in the state.

There is a need to identify the best uses of biomass for electricity production, heat generation, and transportation fuels. However, currently there is no analysis tool that integrates economics, resource availability, emissions, and air quality impacts.

Project Description

This project will quantitatively assess the energy and environmental impacts of increased bioenergy generation, and biogas production and utilization in transportation fuels in California, with an emphasis on air quality improvement and economic viability.

The project will characterize the air quality, greenhouse gas, fossil fuel consumption and economic implications of increased biomass and biogas usage for several electricity generation, heating, and transportation fuel strategies. It will also assess the potential implementation of new



Sources of biomass for bioenergy generation
Photo credit: Ocean Forest Energy Research

bioenergy infrastructure to inform preferred uses and strategies for a set of California renewable resources. The analysis will quantify the emissions of criteria pollutants for several biomass and biogas technology supply chain and utilization scenarios. The resulting emissions will be spatially and temporally resolved for use in air quality modeling.

Anticipated Benefits for California

Results from this study will complement ongoing research and help inform policymakers and industry members about the biopower production policy and technology alternatives needed to meet energy and environmental goals in California.

Increased biopower production and use of sustainable biomass will diversify the state's energy supply, and improve energy security. It can also

provide a range of economic and environmental benefits. It creates green jobs, enhances rural economic development, and promotes local economic stability. Biopower provides an alternative disposal option for communities with forest, agricultural (including dairy), municipal waste and other biogenic residues. In general, traditional disposal options include open-field burning, sending material to a landfill, or applying material on rural land. Using biomass from wildfire fuel reduction and agricultural residues can reduce the occurrence of large costly wildfires, protect watersheds and ecosystems, provide an alternative to open field burning, and increase the efficiency and profitability of forestry and farming. Use of these residues may have additional lifecycle benefits, including improved local air quality and public health, reduced greenhouse gas emissions, and reducing the amount of waste needed to be buried in landfills.

Project Specifics

Contract Number: 500-11-028
Contractor: Advanced Power and Energy Program – UC Irvine
City/County: Irvine/Orange
Application: Statewide
Amount: $397,236
Term: June 2012 to March 2015

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